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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,783	12/11/2003	Timo Kolchmainen	KOLS.075PA	8178
<div>7590 03/21/2007 Hollingsworth &amp; Funk, LLC Suite 125 8009 34th Avenue South Minneapolis, MN 55425</div>			<div>EXAMINER NEGRON, WANDA M</div> <div>ART UNIT 2622 PAPER NUMBER</div>	
SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE		
3 MONTHS	03/21/2007	PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/733,783

Applicant(s)

KOLEHMAINEN ET AL.

Examiner

Wanda M. Negrón

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

3. **Claim 13** recites the limitation "the sensor array" in line 3. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1, 7 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Smith (US 5,926,218).**

6. Regarding **claim 1**, Smith discloses an imaging device (see figure 1) comprising at least one image capturing subsystem of a first type, i.e. optical section 20 and image sensor 22, comprising a lens arrangement (20), configured to produce images, at least one image capturing subsystem of a second type, i.e. optical section 16 and image

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sensor 18, comprising a lens arrangement (16), having optical or light gathering properties different from the subsystem of first type, i.e. the first type has a variable focal length and the second type has a fixed focal length (see col. 4, lines 45-58), configured to produce an image, and a controller, i.e. a microprocessor (52) configured to select the subsystem with which an image is to be taken (see col. 3, lines 52-60).

7. Regarding **claim 7**, Smith discloses that the image capturing subsystem of the second type comprises a color matrix filter (see col. 5, lines 8-12), and the controller is configured to take images with the subsystems in sequence (see col. 4, lines 59-64) to capture fast motion objects.

8. Regarding **claim 10**, Smith discloses that the image capturing subsystems comprise a lens system (20, 16) and a sensor array configured to produce an electric signal, e.g. CCD imagers (22, 18), and the device comprises a processor (52) operationally connected to the sensor arrays (see figure 1) and configured to produce an image proportional to the electrical signal received from the sensor arrays (see col. 3, lines 12-34).

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. **Claims 2-6 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (US 5,926,218).**

11. Regarding **claims 2-6**, as mentioned in the discussion of claim 1 above, Smith discloses all the limitations of the parent claim. Official notice is taken that the concept and the advantage of using a macro, a high-magnification, a tele, or an anamorphically cylindrical lens are well known in the art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the most appropriate lens, regarding its focal length, depth of field, and angle of view, for the imaging application required by the user, e.g. videoconferencing, portrait photography, surveillance, etc., in order to obtain an image with the second type image capturing subsystem taught by Smith.

12. Regarding **claim 8**, Smith discloses that the second type subsystem should provide "live resolution" or "motion-capable resolution", which may be below video resolution (see col. 2, lines 50-57). Official notice is taken that the concept and the advantage of incorporating camera systems in phone applications, e.g. videophones and camera phones, is well known in the art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a videoconferencing resolution, i.e. a videophone resolution, in the second type image capturing subsystem taught by Smith when incorporating the imaging system taught by Smith in a phone device.

13. Regarding **claim 9**, Official notice is taken that CIF and QCIF are well-known camera resolutions for videoconferencing applications. Therefore, it would have been

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obvious to one having ordinary skill in the art at the time the invention was made to use either CIF or QCIF in a videophone application since CIF/QCIF are the standards for videoconferencing, e.g. videophone, applications.

14. **Claims 11-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (US 5,926,218) as applied to claims 1-10 above, and further in view of Denyer (WO 93/11631).**

15. Regarding **claim 11**, as mentioned in the discussion of claims 1 and 10 above, Smith discloses all the limitations of the parent claim. However, Smith does not teach that the imaging device comprises a sensor array divided between image capturing subsystem types, i.e. an image sensor with various sensing regions disposed on the same plane.

Denyer, on the other hand, teaches two or more cameras on one chip having the sensors in the same plane (see page 2, lines 11-18), thus obtaining cameras that are easy to calibrate while minimizing alignment problems (see page 2, lines 13-25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to implement the sensor array disclosed by Denyer in the imaging system taught by Smith in order to obtain a camera system that is easy to calibrate and to minimize alignment problems.

16. Regarding **claim 12**, as mentioned in the discussion of claim 1 above, Smith discloses all the limitations of the parent claim. However, Smith does not teach that the device comprises a lenslet array, i.e. small lenses disposed in the same plane, with at least four lenses.

On the other hand, Smith discloses in column 3, lines 1-5 that the imager subsystem of the first type is a high resolution system, while the imager subsystem of the second type is a low resolution system. Official notice is taken that the use of monochromatic sensors, i.e. sensors integrated with a filter corresponding to red, green or blue wavelengths, is well known in the art as a lower cost alternative to color filter arrays with the added advantage of the use of the full resolutions of the sensors.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a multiple-sensor configuration instead of one sensor with a color filter array in the high resolution subsystem taught by Smith because it would be less expensive to manufacture and the full resolution of the monochromatic sensors would be used to obtain a full-color image.

Furthermore, Denyer discloses a multiple-sensor configuration where the three sensors are disposed in the same plane, and the color filters are laid out in a lenslet array (see figure 1 and 2). A change in size, e.g. adding a sensor with its respective filter to the configuration taught by Denyer, is generally recognized as being within the level of ordinary skill in the art.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a four-lens lenslet array, i.e. three lenses for the red, blue and green monochromatic sensors of the subsystem of the first type and one lens for the color filter array of the subsystem of the second type, in the device taught by Smith in order to obtain a camera with a thinner profile while minimizing alignment errors (see Denyer, page 2, lines 11 *et seq.*).

17. Regarding **claim 13**, Smith, as modified by Denyer, discloses that the lens arrangement of the image capturing subsystem of the first type device comprises three lenses from the lenslet array, i.e. the red, green and blue lenses (see Denyer, figure 1), and a portion of the sensor array, interpreted as three sensing areas disposed contiguously in the same plane (see Denyer, figure 1), and the lens arrangement of the image capturing subsystem of the second type device comprises the fourth lens from the lenslet array, i.e. a color filter array (see Smith, col. 5, lines 8-12), and a portion of the sensor array, interpreted as a fourth sensing area disposed contiguously in the same plane as the other three sensing areas. As mentioned in the discussion of claim 12 above, including a fourth sensing area, with its respective filter, to the sensor configuration taught by Denyer would have been recognized as being within the level of ordinary skill in the art.

18. Regarding **claim 14**, Smith, as modified by Denyer, discloses that the image capturing subsystem of a first type is configured to produce a color image (see Denyer, page 4, lines 27-32) and the image capturing subsystem of the second type is configured to produce an image (see Smith, Abstract).

19. Regarding **claims 15 and 16**, Smith, as modified by Denyer, discloses that the lens arrangement of the image capturing subsystem of the first type comprises a red, green and blue color filter or a cyan, magenta and yellow color filter, each associated with a lens (see Denyer, page 4, lines 27-32).

20. Regarding **claim 17**, Smith, as modified by Denyer, discloses that the lens arrangement of the subsystem of the second type comprises a color filter array (see



Smith, col. 5, lines 8-12). However, Smith, as modified by Denyer, does not explicitly teach that the color filter array corresponds to a Bayer matrix. Official notice is taken that the use and advantage of a color filter array having a Bayer configuration is well known in the art, and that said configuration provides a luminance-dominated sampling, i.e. more green elements than red or blue elements. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to implement a Bayer configuration in the color filter array of the subsystem of the second type because such pattern provides a luminance-dominated sampling which is closer to the response of the human vision system.

21. Regarding **claim 18**, Smith, as modified by Denyer, does not explicitly teach that the subsystems of the first and the second type are configured to produce images in the same color space. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the image capturing subsystems of the first and the second type configured to produce images in the same color space because the same color correcting matrix (see Denyer, figure 4) could be used to correct the colors of the images obtained from both subsystems, simplifying the design of the imaging device.

22. Regarding **claim 19**, Smith discloses an imaging device (see figure 1) comprising at least one image capturing subsystem of a first type, i.e. optical section 20 and image sensor 22, comprising a lens arrangement (20), configured to produce images, at least one image capturing subsystem of a second type, i.e. optical section 16 and image sensor 18, comprising a lens arrangement (16), having optical or light gathering

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properties different from the subsystem of first type, i.e. the first type has a variable focal length and the second type has a fixed focal length (see col. 4, lines 45-58), configured to produce an image, and a controller, i.e. a microprocessor (52) configured to select the subsystem with which an image is to be taken (see col. 3, lines 52-60). However, Smith does not teach that the device comprises a lenslet array, i.e. small lenses disposed in the same plane, with at least four lenses.

On the other hand, Smith discloses in column 3, lines 1-5 that the imager subsystem of the first type is a high resolution system, while the imager subsystem of the second type is a low resolution system. Official notice is taken that the use of monochromatic sensors, i.e. sensors integrated with a filter corresponding to red, green or blue wavelengths, is well known in the art as a lower cost alternative to color filter arrays with the added advantage of the use of the full resolutions of the sensors.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a multiple-sensor configuration instead of one sensor with a color filter array in the high resolution subsystem taught by Smith because it would be less expensive to manufacture and the full resolution of the monochromatic sensors would be used to obtain a full-color image.

Furthermore, Denyer discloses a multiple-sensor configuration where the three sensors are disposed in the same plane, and the color filters are laid out in a lenslet array (see figure 1 and 2). A change in size, e.g. adding a sensor with its respective filter to the configuration taught by Denyer, is generally recognized as being within the level of ordinary skill in the art.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a four-lens lenslet array, i.e. three lenses for the red, blue and green monochromatic sensors of the subsystem of the first type and one lens for the color filter array of the subsystem of the second type, in the device taught by Smith in order to obtain a camera with a thinner profile while minimizing alignment errors (see Denyer, page 2, lines 11 *et seq.*).

In addition, Smith, as modified by Denyer, discloses that the lens arrangement of the image capturing subsystem of the first type device comprises three lenses from the lenslet array, i.e. the red, green and blue lenses (see Denyer, figure 1), and a portion of the sensor array, interpreted as three of four sensing areas disposed contiguously in the same plane (see Denyer, figure 1), and the lens arrangement of the image capturing subsystem of the second type device comprises the fourth lens from the lenslet array, i.e. a color filter array (see Smith, col. 5, lines 8-12), and a portion of the sensor array, interpreted as a fourth sensing area disposed contiguously in the same plane as the other three sensing areas. As mentioned above, including a fourth sensing area, with its respective filter, to the sensor configuration taught by Denyer would have been recognized as being within the level of ordinary skill in the art.

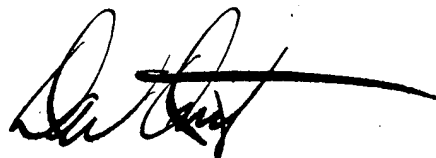
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23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wanda M. Negrón whose telephone number is (571) 270-1129. The examiner can normally be reached on Mon-Fri 6:30 am - 4:00 pm alternate Fri off.

24. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

25. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wanda M. Negrón  
March 15, 2007

A handwritten signature in black ink, appearing to read 'David Ometz', with a long horizontal stroke extending to the right.

DAVID OMETZ  
SUPERVISORY PATENT EXAMINER